



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/715,353	12/14/2012	Jeffrey Santrock	P023310-GMVE-DPH	1034
104102	7590	04/28/2017	EXAMINER	
BrooksGroup 48685 Hayes Shelby Township, MI 48315			MC GINTY, DOUGLAS J	
			ART UNIT	PAPER NUMBER
			1765	
			MAIL DATE	DELIVERY MODE
			04/28/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEFFREY SANTROCK, TODD J. GORDON,
JEFFREY A. BOZEMAN, and BRYAN M. STYLES

Applicant: GM Global Technology Operations LLC

Appeal 2016-004358
Application 13/715,353¹
Technology Center 1700

Before LINDA M. GAUDETTE, N. WHITNEY WILSON, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

DENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL²

¹ Appellant identifies General Motors LLC as the real party in interest.
Appeal Br. 3.

² In this Opinion, we refer to the Specification filed December 14, 2012 (“Spec.”); the Final Action mailed February 4, 2015 (“Final Act.”); the Advisory Action mailed May 11, 2015 (“Adv. Act.”); the Appeal Brief filed September 3, 2015 (“Appeal Br.”); the Examiner’s Answer mailed January 20, 2016 (“Ans.”); and the Reply Brief filed March 18, 2016 (“Reply Br.”).

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from a rejection of claims 1–23. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The claims are directed to refrigeration compositions, refrigeration systems and methods of making, operating, and using the same. Claims 1, 12, and 21. Independent claims 1, 12, 20, and 21, reproduced below, are illustrative of the claimed subject matter:

1. A product comprising:

a vehicle having an engine compartment, a combustion engine and exhaust gas system connected to the combustion engine constructed and arranged to discharge exhaust gas therefrom, wherein the combustion engine and at least a portion of the exhaust gas system are in the engine compartment;

a refrigeration system in the engine compartment positioned such that venting of the refrigerant results in the refrigerant coming in contact with components at high temperatures, and wherein the refrigeration system includes a refrigerant including $\text{CF}_3\text{CF}=\text{CH}_2$, the refrigeration system including a lubricating oil or grease, the refrigerant including $\text{CF}_3\text{CF}=\text{CH}_2$ ignites with oxygen at a first temperature, is combined with the lubricating oil or grease, which ignites with oxygen at a second temperature, so that a resultant mixture is provided that ignites with oxygen at a third temperature greater than the first temperature.

12. A product comprising:

a mixture comprising including $\text{CF}_3\text{CF}=\text{CH}_2$ and a lubricating oil or grease, the $\text{CF}_3\text{CF}=\text{CH}_2$ ignites with oxygen at a first temperature, is combined with the lubricating oil or grease which ignites with oxygen at a second temperature, so that the mixture ignites with oxygen at a third temperature greater than the first temperature.

20. A product comprising a refrigerant including $\text{CF}_3\text{CF}=\text{CH}_2$ and a lubricating or grease including a fluorinated component.

21. A method comprising:

providing a vehicle having an engine compartment, a combustion engine and exhaust gas system connected to the combustion engine constructed and arranged to discharge exhaust gas therefrom, wherein the combustion engine and at least a portion of the exhaust gas system are in the engine compartment;

a refrigeration system in the engine compartment positioned such that venting of the refrigerant results in the refrigerant coming in contact with components at high temperatures, and wherein the refrigeration system includes a refrigerant including $\text{CF}_3\text{CF}=\text{CH}_2$ and the refrigerant carrying a lubricating oil or grease, wherein the refrigerant including $\text{CF}_3\text{CF}=\text{CH}_2$ ignites with oxygen at a first temperature, is combined with the lubricating oil or grease, which ignites with oxygen at a second temperature, so that a resultant mixture is provided that ignites with oxygen at a third temperature greater than the first temperature.

Appeal Br. 16, 18, 20 (Claims App'x).

REFERENCES

The Examiner maintains the rejections of the claims on appeal over the following prior art:

Leck et al. US 2007/0187639 A1 Aug. 16, 2007
(Hereinafter "Leck")

DuPont™ Krytox® Performance Lubricants Product Overview
("DuPont"), copyright 2010

REJECTIONS³

The Examiner rejects the claims as follows: (1) claims 12–16 and 20 are rejected under 35 U.S.C. § 102(b) over Leck (Final Act. 4); (2) claims 1–5, 9–16, and 20–23⁴ are rejected under 35 U.S.C. § 103(a) as obvious over Leck in view of admission and documentation of well-known facts (Final Act. 5); and (3) claims 1–23 are rejected under 35 U.S.C. § 103(a) as obvious over Leck in view of admission and documentation of well-known facts and further in view of DuPont (*id.* at 6).

OPINION

Rejection of claims 12–16 and 20 as anticipated by Leck

Appellant argues for patentability of claim 12, but does not separately address its dependent claims 13–16. Therefore, claims 13–16 will stand or fall with claim 12.

Claim 12 requires “a mixture comprising including [CF₃CF=CH₂] and a lubricating oil or grease.” Appeal Br. 18 (Claims App’x). The Specification states that the refrigerant of the invention “may include 2,3,3,3-tetrafluoroprop-1-ene [(CF₃CF=CH₂)]” and that “suitable refrigerants including CF₃CF=CH₂ [are] commonly known as R1234yr or HFO1234yf and are available from Honeywell and DuPont.” Spec. ¶ 14. The Specification also states that “[s]uitable lubricating oils and grease for

³ The Examiner’s rejections of claims 1–19 and 21 under 35 U.S.C. § 112, first and second paragraphs, were withdrawn in the Advisory Action. Adv. Act. 1.

⁴ The Examiner notes in the Answer (3) that claims 22 and 23 (added after the Final Action) are rejected in the Advisory Action (1).

numerous variations of the invention are available from DuPont under the tradename KRYTOX.” *Id.* at 24.

The Examiner finds that Leck discloses a refrigeration system comprising a refrigerant such as 2,3,3,3-tetrafluoro-1-propene, which is also known as 2,3,3,3-tetrafluoroprop-1-ene and $\text{CF}_3\text{CF}=\text{CH}_2$, and a perfluoropolyether. Final Act. 4 (citing Leck ¶ 10). The Examiner further finds that Leck explicitly discloses KRYTOX, a perfluoropolyether having 2–100 repeating units (*id.* (citing Leck ¶ 15)), as being a suitable perfluoropolyether, and that the Specification likewise discloses that “[s]uitable lubricating oils and grease for numerous variations of the invention are available from DuPont under the tradename KRYTOX” (Spec. ¶ 24; *see id.*). The Examiner therefore finds that Leck discloses a mixture comprising $\text{CF}_3\text{CF}=\text{CH}_2$ and a lubricating oil or grease identified in the Specification. *Id.* The Examiner acknowledges that, with respect to claims 12–16, Leck does not expressly teach that “‘the refrigerant . . . ignites (with oxygen) at (a) first temperature,’ ‘the lubricating oil or grease . . . ignites (with oxygen) at (a) second temperature,’ and that a resultant mixture ignites at a higher third temperature.”⁵ *Id.* at 4–5. However, because Leck discloses $\text{CF}_3\text{CF}=\text{CH}_2$ and one of the same lubricating oils identified in the Specification, the Examiner finds that Leck anticipates claims 12–16 because “compositions with the same ingredients would be expected to have the same properties.” *Id.* at 5. In other words, the Examiner finds that Leck

⁵ As indicated *supra*, Appellant followed the Examiner’s recommendation and amended the claims to recite “with oxygen” at “a” temperature in the Amendment After Final.

describes a mixture that inherently possesses the characteristics of the claimed mixture.

Appellant points out that Leck discloses over 100 possible refrigerants and over 100 possible additives. Appeal Br. 10. Appellant contends that Leck contains no teaching that would have led a person of ordinary skill in the art at the time of the invention to “select the correct combination of constituents from all the possible combination[s] of constituents” that would result in a mixture that ignites with oxygen at a temperature greater than the temperature at which $\text{CF}_3\text{CF}=\text{CH}_2$ ignites with oxygen. *Id.*

Appellant’s argument is persuasive. *See In re Arkley*, 455 F.2d 586, 587-88 (CCPA 1972) (“[F]or the instant rejection under 35 U.S.C. 102(e) to have been proper, the . . . reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.”) Such clear and unequivocal disclosure is lacking here, given the lack of any teaching in Leck to select $\text{CF}_3\text{CF}=\text{CH}_2$ over some 100+ other disclosed refrigerants.

We therefore do not sustain the Examiner’s rejection of claim 12 as anticipated by Leck. We also do not sustain the rejection of its dependent claims 13–16.

Although the Examiner includes claim 20 in the anticipation rejection, the claim is not further addressed in the Final Action. *See* Final Act. 4–5. In the Answer, the Examiner finds that $\text{CF}_3\text{CF}=\text{CH}_2$, as recited in claim 20, is the same as the 2,3,3,3-tetrafluoro-1-propene in Leck, and the “fluorinated

component” of claim 20 encompasses the perfluoropolyether in Leck. Ans. 6.

Appellant does not dispute the Examiner’s finding that Leck describes a mixture of $\text{CF}_3\text{CF}=\text{CH}_2$, and a lubricant including a fluorinated component. *See* Reply Br. 6. Rather, Appellant contends that the Examiner has not shown that Leck discloses a “refrigerant *including* [$\text{CF}_3\text{CF}=\text{CH}_2$].” Reply Br. 6. In other words, Appellant argues that the claim language requires that the refrigerant contain additional components, and the Examiner therefore has not shown the presence of compositions with the same ingredients.

We disagree. Non-conventional transitional phrases (i.e., other than “comprising,” “consisting essentially of,” and “consisting”) are interpreted in light of the specification to determine whether open or closed claim language is intended. *See, e.g., Lampi Corp. v. American Power Prods. Inc.*, 228 F.3d 1365, 1376 (Fed. Cir. 2000) (interpreting “having” as open terminology, allowing the inclusion of other components in addition to those recited); *Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1376 (Fed. Cir. 2004) (“[L]ike the term ‘comprising,’ the terms ‘containing’ and ‘mixture’ are open-ended.”).

We find nothing in the Specification to suggest that “including” was intended as other than open claim language, allowing but not requiring additional, unrecited elements. Therefore, the refrigerant of claim 20 requires the presence of $\text{CF}_3\text{CF}=\text{CH}_2$, and may, but need not necessarily, include additional elements.

Leck discloses a product comprising 2,3,3,3-tetrafluoro-1-propene ($\text{CF}_3\text{CF}=\text{CH}_2$) and a perfluoropolyether, which is a lubricating oil including a fluorinated component, which meets the claim limitations.

Appellant has not shown that the Examiner reversibly erred in rejecting claim 20 as anticipated by Leck.

We sustain the Examiner's rejection of claim 20 as anticipated.

Rejection of claims 1–5, 9–16, and 20–23 as obvious over Leck in view of admission and documentation of well-known facts

The Examiner finds claims 1–5, 9–16, and 20–23 obvious over Leck in view of well-known facts. Final Act. 5; Adv. Act. 1. Appellant only addresses independent claims 1, 12, and 21, and dependent claims 4 and 15. Appeal Br. 11–12; Reply Br. 6–7. The remaining dependent claims stand or fall with their independent claims.

Claim 1 recites “a product comprising a vehicle having an engine compartment, a combustion engine and exhaust gas system connected to the combustion engine constructed and arranged to discharge exhaust gas therefrom, wherein the combustion engine and at least a portion of the exhaust gas system are in the engine compartment.” Similarly, claim 21 recites “a method comprising providing a vehicle having an engine compartment” Appeal Br. 16, 20 (Claims App'x).

The Examiner finds that Leck does not “specifically teach a vehicle with an engine compartment, combustion engine, exhaust gas system, and refrigeration (air conditioning) system,” but that the Specification admits and documents the well-known facts that those systems are commonly found in motor vehicles. Final Act. 5.

Appellant contends that the rejection is based on reversible error for relying on paragraph 3 of the Specification. Appeal Br. 12. This argument is not persuasive because, as explained by the Examiner, the Specification was relied on merely as evidentiary support for the Examiner's findings with respect to the knowledge and common sense of the ordinary artisan at the time of the invention, e.g., that "a motor vehicle commonly has an engine compartment, combusting engine, exhaust gas system, and refrigeration (air conditioning) system." Adv. Act. 2; *see* Ans. 8. Appellant has not provided persuasive evidence to refute these findings. *See* Reply Br. 7.

Appellant also contends that "claims 1, 12, and 21 recite limitations not suggested by Leck in view of 'admission and documentation of well-known facts.'" Appeal Br. 12. Appellant argues that Leck discloses over 100 possible refrigerants and over 100 possible additives. *Id.* According to Appellant, neither Leck nor other prior art teaches that a specific refrigerant should be selected from all the possibilities disclosed in Leck or that a specific oil or grease should be selected from all of Leck's possibilities. *Id.*

The Examiner finds that Leck teaches refrigerants such as $\text{CF}_3\text{CF}=\text{CH}_2$ (Leck ¶ 10) and lubricant oils or greases such as perfluoropolyether. Ans. 6–7. The Examiner finds that Leck discloses KRYTOX perfluoropolyether, which is "a suitable lubricating oil[] or grease," per the Specification. Final Act. 6. The Examiner also finds that Leck provides direction to select KRYTOX. Ans. 9. The Examiner finds Leck discloses any of the refrigerants listed in paragraph 10 may be combined with KRYTOX. Moreover, Leck explicitly describes an embodiment comprising a perfluoropolyether in combination with an

unsaturated fluorocarbon in a limited list that includes 2,3,3,3-tetrafluoro-1-propene. Leck ¶ 38, claim 13.

For purposes of § 103, a reference is prior art for all that it discloses. *Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1578 (Fed. Cir. 1991). The fact that a reference “discloses a multitude of effective combinations does not render any particular formulation less obvious.” *See Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989); *see also In re Corkill*, 771 F.2d 1496, 1500 (Fed. Cir. 1985) (obviousness rejection of claims affirmed in light of prior art teaching that “hydrated zeolites will work” in detergent formulations, even though “the inventors selected the zeolites of the claims from among ‘thousands’ of compounds”); *In re Susi*, 440 F.2d 442, 445 (CCPA 1971) (obviousness rejection affirmed where the disclosure of the prior art was “huge, but it undeniably include[d] at least some of the compounds recited in appellant’s generic claims and [was] of a class of chemicals to be used for the same purpose as appellant’s additives”). Therefore, Appellant’s argument for non-obviousness based on Leck’s disclosure of multiple refrigerants and additives is unpersuasive, since Appellant has not shown persuasively that the Examiner’s finding that Leck provides direction to select a refrigerant and a lubricating component that would meet the claim limitations is erroneous or unreasonable.

In the Reply Brief, Appellant argues that “the rejection [of claims 1, 12, and 21] is in error because the Examiner has not shown that Leck discloses a ‘refrigerant *including* CF₃CF=CH₂.’” Reply Br. 7 (emphasis in original). As addressed above with respect to claim 20, Appellant argues that the claim language requires that the refrigerant contain additional components, and the Examiner therefore has not shown the presence of

compositions with the same ingredients. For the reasons given above, we determine that the word “including” is open claim language, like “comprising.” Appellant’s argument otherwise is unavailing.

With respect to claims 4 and 15, which each require that a fluorinated lubricating oil comprises a low molecular weight fluorine homopolymer of hexafluoride propylene epoxide (Appeal Br. 17, 19 (Claims App’x)), the Examiner finds that Leck teaches perfluoropolyethers having 2–100 repeating units. Ans. 8. Appellant does not dispute the Examiner’s finding. *See generally* Reply Br.

Appellant incorrectly states that claim 20 is a dependent claim and is allowable for the same reasons as independent claims 1, 12, and 21. Reply Br. 7.

Based on the foregoing, Appellant has not persuaded us of reversible error in the Examiner’s determination that claims 1–5, 9–16, and 20–23 would have been obvious over Leck in view of the admission and documentation of well-known facts.

Rejection of claims 1–23 as obvious over Leck in view of admission and documentation of well-known facts and further in view of DuPont™ Krytox Performance Lubricants

The Examiner finds that Leck teaches refrigerants and lubricant additives such as KRYTOX, and well-known facts establish the use of refrigeration (air conditioning) systems in a vehicle. Final Act. 5–6. The Examiner finds DuPont likewise describes “the underhood of an automobile (engine compartment), an engine with spark plugs (combustion engine), and emission (exhaust gas) system. *Id.* at 6. The Examiner further finds that DuPont teaches that KRYTOX is nonflammable due to the lack of hydrogen,

with no ignition at temperatures of up to 482°C (900°F) in oxygen and at pressures of up to 350 bar. Ans. 9 (citing DuPont 5 and 12). The Examiner determines that one skilled in the art would have had a reasonable expectation of success in combining the teachings, and that the resultant composition with the same ingredients would have been expected to have the same properties. *Id.* Therefore, the Examiner concludes that it would have been obvious to combine the teachings of Leck, and DuPont with well-known facts to reach the claimed invention because one of ordinary skill in the art at the time of the invention would have wanted minimal flammability in an automobile air conditioning system as a matter of common sense. *Id.*

Appellant argues that the disclosures fail to suggest that a combination of Leck's possible refrigerants and DuPont's fluorinated oils and greases would still be effective as a refrigerant mixture or that the resultant mixture would have an ignition temperature higher than the refrigerant. Appeal Br. 13. Appellant also argues that the combined references do not suggest the properties recited in claims 1, 12, and 21. *Id.* at 14. Finally, Appellant argues that "the reason for the proposed combination of references lack[s] rationale underpinning because the Examiner has failed to articulate where in the references it is taught that [KRYTOX] has 'minimal flammability' as stated in the Final Office Action." *Id.*

"The combination of familiar [elements] according to known methods is likely to be obvious when it does no more than yield predictable results," as is the case here. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007). "[W]hen the prior art evidence reasonably allows the PTO to conclude that a claimed feature is present in the prior art, the evidence 'compels such a conclusion if the applicant produces no evidence or argument to rebut it.'" *In*

re Crish, 393 F.3d 1253, 1259 (Fed. Cir. 2004) (quoting *In re Spada*, 911 F.2d 705, 708 n.3 (Fed. Cir. 1990)).

Appellant's arguments are not persuasive because they have not provided persuasive evidence to show that the Examiner erred in finding the prior art discloses or suggests a mixture that would inherently possess the characteristics of the claimed mixture. Moreover, Appellant has not explained why the reasons articulated by the Examiner for combining the references is erroneous or unreasonable.. See *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). On this basis, we sustain the Examiner's rejection of claims 1–23.

DECISION

For the above reasons, the Examiner's rejection of claims 1–23 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED